

BIOASSAY, CARCINOGENESIS and TISSUE CULTURE

THE COUNCIL FOR TOBACCO RESEARCH - U.S.A.

No. 518

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NEW YORK, N.Y. 10017

Application For Research Grant

Date: November 16, 1965

1. Name of Investigator: William Weiss, M.D.

2. Title: Clinical Director, Pulmonary Disease Service

3. Institution & Address: Philadelphia General Hospital
34th St. and Curie Ave.
Phila., Pa. 19104

4. Project or Subject: The bioassay of cigarette smoke toxins with Paramecium aurelia

5. Detailed Plan of Procedure (Use additional pages if more space is required.)

The water-soluble toxins of cigarette smoke, mainly those in the gas phase, cause the death of Paramecium in sufficient concentration. The survival time is a measure of the concentration of toxins within certain limits. The response of Paramecium to smoke toxins is similar to the response of ciliated human tracheal epithelium as described by Ballenger. Therefore it may be possible to estimate the degree and duration of smoke toxicity for tracheobronchial epithelium during and after smoking by determining the effect of expired air on Paramecium. The objective of this study is to try to develop a bioassay method.

Preliminary experiments show that Paramecium can be used in a hanging drop preparation in a Rose perfusion chamber to detect the presence of cigarette smoke gas phase in dilutions to at least 10 %. A standard dose-response curve will be developed to provide a means for estimating toxicity in expired air. Exploratory data suggest that the toxicity detectable by protoplasm rapidly disappears after smoking ends, using death of the organisms as the end-point. Photographic means will be used in an attempt to develop a motility endpoint.

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